Managing Complex System Disruptions
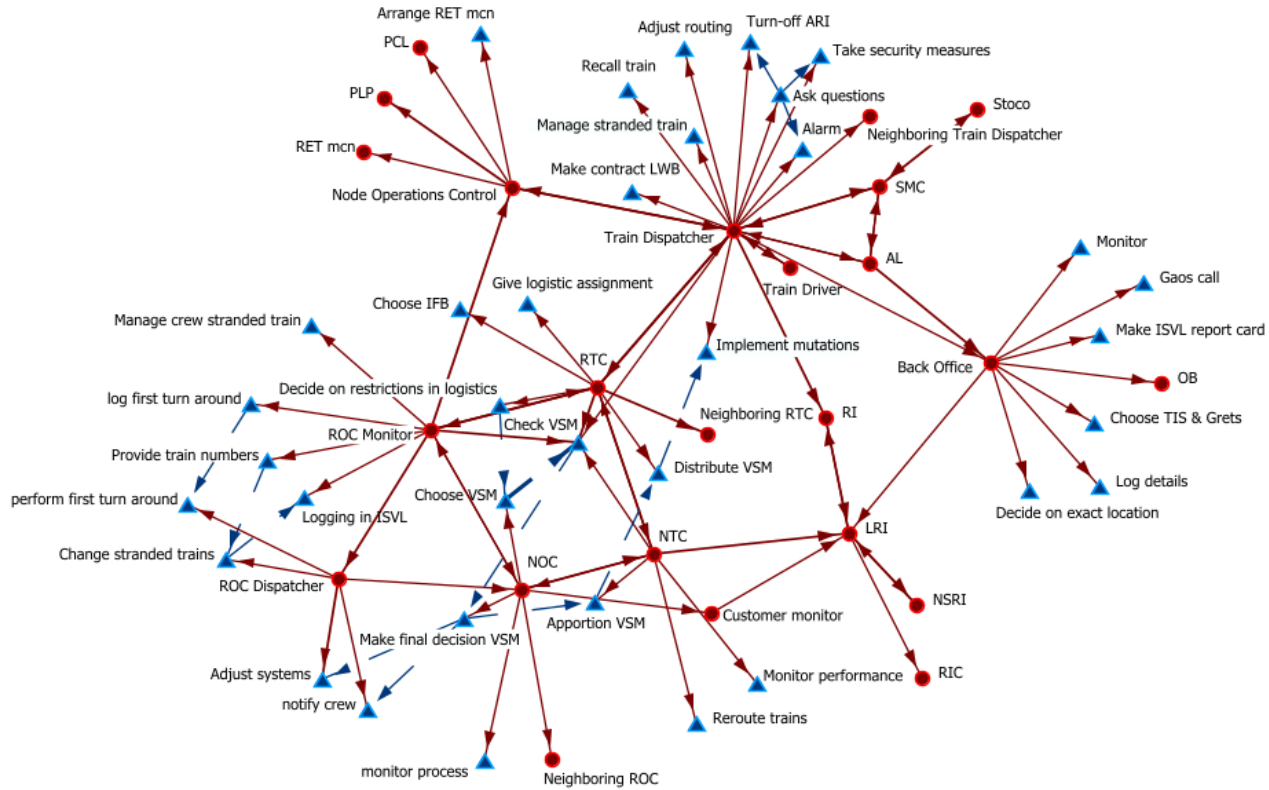

Danny Schipper　　　　　　　　　ExploRail Symposium　10-10-2017

Network of control centres

Our research

"How do practices of communication and coordination influence the efficient management of disruptions in the complex Dutch rail system?"

Research activities:

- Quantitative and qualitative analysis of the communication and coordination during large disruptions
- Etnographic research with a focus on the daily practices in the different control centres
- A European comparison of disruption management practices

Findings

❏ *Sharing and discussing information is neglected during periods of high workload*

- Operators prioritize own tasks or local problems.
- Few information updates to OCCR
- Operators act on the basis of faulty assumptions.

❏ *Misunderstandings are very common among teams*

- Teams interpret information differently
- Misunderstanding often remain uncorrected
- Operators hide behind their own procedures and collective sensemaking is weakly developed.

Findings

❑ *The Dutch railway system strongly relies on anticipation in comparison to other European countries*

– Contingency plans structure the disruption management process
– Plans and procedures create blind spots that led people to miss the need to improvise and fall back on their own expertise.

❑ *Teams in the OCCR and those in the region don't operate well together*

– Not much clarity on the divison of roles and responsibilites between the regional and national level. Strong coordination from the OCCR often comes too late, while the region keeps the OCCR too much at a distance.
– Communication and coordination skills weakly developed

Erasmus Universiteit Rotterdam

vrije Universiteit

Vrije Universiteit Amsterdam

Recommendations

- Better information and communication systems, more detailed plans, and command & control are thought to improve communication and coordination, but this only applies to routine situations.

- Our research shows that unexpected events call for improvisation, which emphasizes collective sensemaking, craftmanship, and relationships between people and teams

- More collective training and evaluation of disruptions is necessary to:
  1. Improve the mutual knowledge operators and teams have of each other's roles, tasks, goals, and procedures. This shared knowledge should improve coordination and communication between teams.
  2. Improve the capability of teams to recognize non-routine situations and to be able to improvise in a coordinated manner